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ABSTRACT

This guide is for use in the classroom and field training of inspection and operational personnel who serve in planned community rodent-control programs. The urban rat survey may be used as the primary means of obtaining information on rat infestations and the conditions favoring rat populations in urban communities. It provides the data necessary for planning an action program to improve the human environment and make it less suitable for rat infestation; also as a basis for later evaluations of program progress. It is suggested, however, the survey not be used as an end in itself and not be undertaken unless its findings will be used to meet the needs of a community. Detailed information is given on the characteristics of urban rat surveys, basic units in the survey and operational program, comprehensive vs. sample surveys, personnel requirements, survey procedures and equipment, premises inspections, data collection, and mapping. The pamphlet concludes with a rat survey quiz of 25 questions. (BL)

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Urban Rat Surveys

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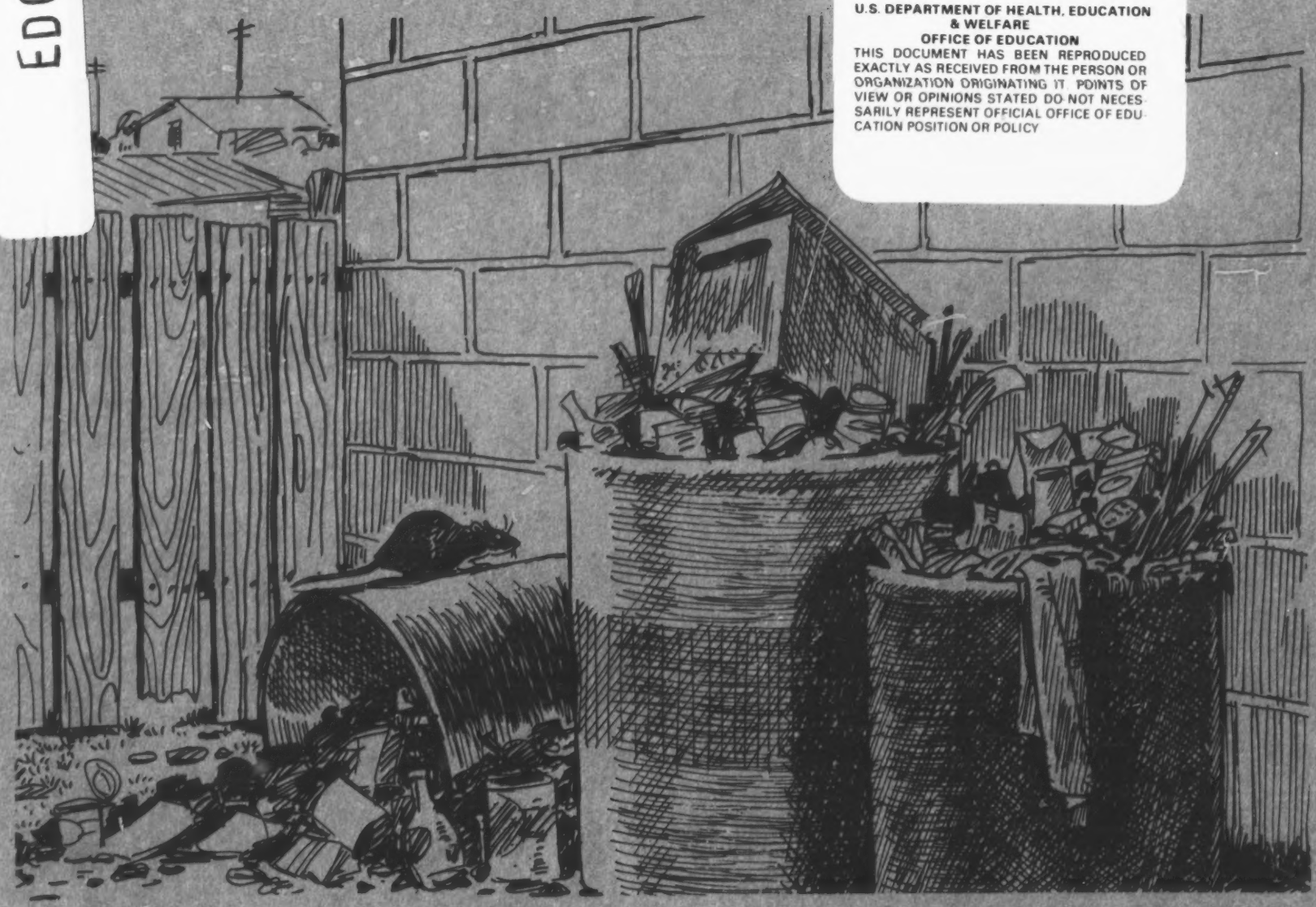

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URBAN RAT SURVEYS

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FEBRUARY 1969

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
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INTRODUCTION

Rats are a problem in urban and rural situations where people fail to control important elements of the environment. The urban rat survey is the primary means of obtaining information on rat infestations and the conditions favoring rat populations in urban communities. It provides the data necessary for planning an action program to improve the human environment and make it less suitable for rat infestation. It also provides the basis for later evaluations of program progress.

There are three distinct phases in an urban rat survey: (1) either a comprehensive inspection or a sampling inspection of residential, commercial, and public areas to record rat infestations and other environmental deficiencies; (2) the preparation of maps, graphs, and tables to summarize results; and (3) the preparation of a report that gives an analysis of the deficiencies found in the urban environment, together with recommendations that will effect improvement.

This guide is for use in the classroom and field training of inspection and operational personnel, who serve in planned community rodent-control programs. However, the urban rat survey is not an end in itself and should not be undertaken unless its findings will be used to meet the needs of a community.

CHARACTERISTICS OF URBAN RAT SURVEYS

The urban rat survey involves an exterior inspection of premises to record significant data such as rat signs, the presence of rat entries to homes, and the incidence of deficiencies that allow rats access to food and harborage. Although the Norway rat (the primary domestic rodent) is essentially a burrowing rodent that lives out of doors, it will enter homes when openings are provided or the odors of food attract it, and if it finds suitable harborage, it may nest and produce young. Therefore interior inspections may be required also, but they are generally made during the operational phase of a rat-control program.

Two record forms are required in the urban rat survey, the field inspection form (Block Record - Rat Inspection), and a summary form for use in office tabulation of the data (Summary - Rat Survey). Through their use sufficient data are obtained to serve as the basis for planning and conducting various phases of a community rodent-control and environmental improvement program, including rat control, improvement in housing, refuse handling, and maintenance of vacant lots, elimination of privies, the removal of junk automobiles and appliances, and other valuable environmental improvements.

BASIC UNITS IN THE SURVEY AND OPERATIONAL PROGRAM

Basic units of measurement used in the rat control program are:

1. Premises - for recording conditions found
2. Blocks - for classifying conditions
3. Census tracts - useful as large subdivisions for planning a program
4. Control area - the entire program area, as determined from survey results

The premises is the basic unit of the program for reporting distinct and identifiable sites where survey items can be observed and recorded. A premises is ordinarily the responsibility of a single family, a superintendent, or a small group of tenants who must be influenced to maintain premises environmental control.

The block is a convenient unit for classifying conditions as good, fair, or poor, and for accomplishing control operations. A committee in each block may improve conditions with minimum participation by the health department.

The census tract is an excellent unit for planning and reporting purposes. Much useful data concerning populations residing in census tracts is available from the U. S. Census Bureau's reports for cities with populations of more than 50,000.

The control area selected for a calendar year should be an infested area where rats can be controlled effectively with the personnel and funds available.

COMPREHENSIVE VS SAMPLE SURVEYS

The block survey can be made on a comprehensive basis, with inspection of all blocks in the selected area; or it can be conducted as a sample survey, with inspection of all premises in only a selected percentage of the blocks, for example, 5 percent. The comprehensive survey produces relatively complete data on rat infestations and sanitary conditions, whereas the data from the sample survey are less comprehensive but nonetheless adequate for planning and for evaluating operations.

The comprehensive survey requires the services of a greater number of personnel than the sample survey, but it also has a considerably greater impact on the community, since all premises are inspected. Also, as the inspectors make their inspections, they can pass out brochures and discuss sanitation with the householders.

The sample survey is made much more quickly. In most cities, the inspections are made in one week and a second week is required to summarize data and prepare a report. The sample survey can be made city-wide, or it can be restricted to a given operational area. A sample survey, well planned and well conducted, is essential in the evaluation of ongoing rat-control programs.

PERSONNEL REQUIREMENTS

The sample survey is made by experienced sanitarians, or by other personnel experienced in public health activities, whereas the comprehensive survey is made by trained subprofessional crews under close technical supervision. In both surveys, the inspectors are guided by and fill out the form, Block Record - Rat Inspection.

At least 3 days of classroom and field orientation and training are required for inspectors in order that their reports may be comparable and the data valid.

A minimum of 30 premises should be inspected per man day if householders are contacted and yards are closely inspected. Up to 100 or more premises can be inspected if inspection is primarily from the front sidewalks and the alleys and if there is little or no contact with the public.

SURVEY PROCEDURES

Survey procedures and forms can be modified to meet local needs. However, an outline of procedures and survey forms are offered here as general guides.

The urban rat survey encompasses:

1. Preparation - planning the operation, recruiting and training staff, and organizing for effective supervision. Provisions should be made for arm bands, identification cards or distinctive uniforms to identify personnel with the program.
2. Inspection - inspecting the blocks and premises and recording data on the block form, utilizing disadvantaged persons from the rat-infested areas as much as possible, under competent supervision.
3. Analysis - tabulation of survey data, analyzing it to obtain the desired information, taking photographs to illustrate the report, and preparation of a report and recommendations, supported by tables, graphs, and maps.
4. Public Information and Education - the use of television, radio, newspapers, brochures, posters, and exhibits to inform the public about community problems and measures needed for eliminating them. Extensive use of parent-teachers associations, clubs, classes, and other groups that will support the objectives of the program.

SURVEY CREWS AND EQUIPMENT

Each survey group of 4 to 6 trained men, plus a foreman, may be divided into teams. Each team should carry two lead pencils, a clipboard, a supply of the "Block Record - Rat Inspection" form, and a copy of survey instructions showing how to fill out the forms. The foreman carries extra supplies and a map of the area to be surveyed. Each 2-man team requires transportation to the area to be worked.

PREMISES INSPECTIONS

Before leaving the office the foreman assigns the blocks his teams are to inspect and makes certain that each team has the necessary supplies. Teams are given several blocks to inspect, to avoid delays, and are taken to the first block to be inspected. The foreman must remain in the immediate area to contact his men frequently, to evaluate their work, and to give them encouragement and support when it is needed. His assistance may be needed to obtain permission for inspection in cases where the inspectors have been refused permission.

It is good practice for the supervisor to fill out the top of the inspection form in the office prior to making assignments. The exact location of blocks is indicated by writing the names of the streets that bound the block to be inspected in the small diagram on the upper left corner of the form. An assignment chart in the office keeps supervisors informed of locations of the teams and their daily progress.

It is best to standardize as to the corner of the block where the inspection is to be started. From this corner the inspectors proceed clockwise around the block, inspecting each premises in order, and finish at the corner where they began. The two men of a team may work together on an inspection, or they may inspect alternate premises and yet be available to furnish assistance to each other. In the latter case, one man acts as the leader and is responsible for completing the inspection form.

Some programs have their inspectors use a large chalk, such as railroad chalk, to mark the corner of the block where inspection is started, as shown in Figure 1. The date, the time of day, the initials of the men, and an arrow indicating the direction of travel are printed. (For example: 8:00 a.m. 4-15-69 BG AS shows that an inspection of that block was begun on the corner marked at 8:00 a.m. on April 15, 1969, by Ben Grogan and Al Simmons.) As they round each corner of the block, the men mark an additional directional arrow on the sidewalk, the street, or a telephone pole so their foreman can find them. A conspicuous colored marker, such as a fluorescent tape may be tied close to the street at the premises under inspection to assist the foreman in finding his inspectors.

Figure 1. Inspector marking block prior to inspection

Each premises is approached from the front sidewalk, and never entered by crossing yards. The inspector goes directly to the front door, where he contacts a responsible adult to obtain permission for the inspection. He may hand the householder a brochure explaining the program, which will supplement his brief explanation of the program and its purpose. Usually only 2 or 3 minutes are required to communicate effectively with householders. In many cases the occupant will want to join in surveying the premises, and this should be encouraged. It offers the inspector an opportunity to tactfully call attention to rat signs or other sanitation deficiencies.

The inspector should be courteous, friendly, and helpful to occupants. This will enhance the reputation of the department he serves. In some areas, especially in apartment districts, personal contacts can be kept to a minimum and premises can be entered either from the sidewalk or from the alley. This is especially the case when inspectors wear distinctive uniforms.

Before proceeding with the exterior inspection, the number of living units on the premises is entered on the block record. This information may be obtained from an occupant or by counting mailboxes or meters.

After receiving permission to inspect, the inspector proceeds around the yard in a counter-clockwise direction, observing deficiencies and recording them on the survey form. He must observe rat signs at close range in order to determine whether the premises is currently infested. (Rat signs are discussed in detail in the guide "Control of Domestic Rats and Mice.") In particular he should look for rat runs in the yard, rat entries into buildings, under walls, or in ditch banks, rat damage and feces in outbuildings, and other evidences of rat infestation. Often the inspector can obtain enough significant information by observing from the sidewalk and the alley. This saves considerable time, since permission for inspections need not be requested.

Under special circumstances, as when a rat bite is reported, inspectors may have to get permission and enter buildings to determine if they have interior infestations (the term "interior infestations" is applied to main buildings and not to sheds or other outbuildings). The inspector should check all rooms for rat signs but should remember that kitchens, closets, bathrooms, attics, and basements are especially attractive to rats.

Before leaving the premises, the inspector checks his form to make certain that all items have been completed. The foreman will recheck the form later in the day, and he may reinspect about 10 percent of the premises to make sure that the information is complete and accurate. There will be instances where people will refuse an inspection. These refusals should be noted on the report form and the cases referred to the foreman for further action. In other instances, there will be no responsible adult at home to grant permission for inspection. In such cases, whether to make an inspection then or wait until a later date is determined by the policy of the department.

In most cases complete block records are checked by the foremen and turned into the office so that the data can be summarized. The "Summary - Rat Survey" form (Figure 3) is used for this purpose. All columns of data from a block form are totaled and the totals for the block are posted on a single line of the summary.

Instructions for Completing the Block Record Form

A form, "Block Record - Rat Inspection" is used for each block inspected (see Figure 2). This form has entry lines for 16 premises. If a block has more premises, a second sheet is used and the sheets are marked "Page 1 of 2" and "Page 2 of 2" in the space provided at the upper right corner of the form. No notation is made if only one form is required for the block. Also, the names or initials of the inspectors are entered at the top of the form in the space provided. Other items of the form heading are filled out in advance by the supervisor.

It is good practice for the supervisor to fill out the top of the inspection form in the office prior to making assignments. The exact location of blocks is indicated by writing the names of the streets that bound the block to be inspected in the small diagram on the upper left corner of the form. An assignment chart in the office keeps supervisors informed of locations of the teams and their daily progress.

The form "Block Record - Rat Inspection," Figure 2, is used to make a detailed premises survey of a block. The columns "Residential" and "Dwelling Units" are included to indicate the degree of overcrowding in rat-infested blocks. This information is used to estimate the number protected by the program and the importance of overcrowding in relation to general sanitation and rat infestations.

Premises Address and Type of Premises - The premises address is posted prior to the inspection of the property. In the case of blocks with row houses or in other blocks with alleys the inspector proceeds around the block writing the premises addresses in the left column and checking either "Residencial," "Business and Residential," or "Business." If the premises is "Business," the check is entered in either the "Food" column or the "Other" column. Only one check is made for a premises. For example, if the premises is "Business and Residential" do not check it also under "Business-Food." If there is a vacant lot, write "Vacant Lot" and place a check in the "Vacant Lot" column. After entering these data the inspector proceeds to the backyards or alley to record other significant information observed from the rear of the homes.

Rat Food and Harborage - All checks made under this heading in the 10 columns provided represent deficiencies (other important deficiencies are described briefly under "Remarks").

FOR TRAINING PURPOSES ONLY

Figure 2

BLOCK RECORD - RAT INSPECTION

City Dixon

County Tiller

Census Tract 117

Block No. 60

Date 6-16-69 Inspector(s) BG - AS

Premises Address	Type of Premises: Residential	Dwelling Units	Business and Residential	Business: Food	Business: Other	Vacant Lot	Rat Food and Harborage: Unapproved Refuse Storage	Lumber on Ground	Food	Abandoned Automobiles	Abandoned Appliances	Other Large Rubbish	Outbuildings	Privies	Board Fences and Walls	Weeds and Grass	Rat Signs: Exterior	Interior	Sewers	Rat Entries	Interior Inspections Made
1. 1201 North Ave.	✓	4					✓	✓		✓	✓	✓	✓		✓		✓		✓	✓	
2. 1207 " "	✓	6					✓					✓	✓		✓		✓	✓		✓	✓
3. 1221 " "	✓	4					✓	✓				✓					✓			✓	
4. 1243 " "	✓	4					✓	✓				✓					✓			✓	
5. Vacant Lot						✓				✓	✓	✓				✓	✓				
6. 1287 North Ave.	✓	4					✓	✓				✓					✓			✓	
7. 646 East St.	✓	2					✓	✓				✓	✓				✓			✓	
8. 660 " "	✓	2					✓	✓				✓		✓			✓			✓	
9. 1296 South Ave			✓				✓		✓	✓		✓	✓	✓	✓		✓	✓		✓	✓
10. 1270 " "	✓	4																			
11. 1242 " "	✓	4																			
12. 1222 " "	✓	4					✓	✓									✓			✓	
13. 1218 Vacant	✓							✓		✓	✓	✓				✓	✓				
14. 1206 South Ave	✓	4					✓	✓			✓										
15. 661 West St.	✓	2																			
16. 633 " "	✓	2															✓			✓	

REMARKS: 1207 North Ave. Rat Bite 12-17-68, male, 68, deep scar on right thumb
1296 South Ave. Grocery with (2) upstairs apartments; old shed with flour and feed and many rat signs.

DHEW, PHS, CPEHS, ECA, AAEP - July 1968

FOR TRAINING PURPOSES ONLY

Figure 3

SUMMARY - RAT SURVEY

City Dixon

County Tiller

Number of Premises with Deficiencies

Census Tract 117

Date 6-17-69 Clerk Mary

Block No.	Number of Premises	Type of Premises: Residential	Dwelling Units	Business and Residential	Business: Food	Business: Other	Vacant Lots	Rat Food and Harborage: Unapproved Refuse Storage	Lumber on Ground	Food	Abandoned Automobiles	Abandoned Appliances	Other Large Rubbish	Outbuildings	Privies	Board Fences and Walls	Weeds and Grass	Rat Signs: Exterior	Interior	Sewers	Rat Entries	Interior Inspections Made
60	16	14	46	1			1	10	9	2	4	4	10	4	2	3	2	12	2	1	10	2

DHEW, PHS, CPEHS, ECA, AAEP - July 1968

Column 1 - Unapproved Refuse Storage. Check this column if there is not proper storage of all household garbage, rubbish and other refuse in approved, rat-tight containers. Some health departments may wish to indicate the various types of deficiencies by another marking, such as different colors of checks. A red check, for example, might refer to unsatisfactory containers, a green check to an inadequate number of containers, and a black check to good containers improperly used.

Column 2 - Lumber on Ground. Check if any lumber or firewood is not stacked about 18 inches off the ground. Do not check as a deficiency if lumber is on the ground as a result of building construction.

Column 3 - Food. Check if animal or human food is exposed outdoors or in an outbuilding. Use an X if an interior inspection is made and food is exposed to rats indoors. Garbage is not recorded as food, but only as unapproved refuse storage under Column 1.

Column 4 - Abandoned Automobiles. Check this column if cars are in the yard or in the adjoining street or alley. A vehicle is considered to be abandoned if the license tag is not current, if parts are missing, or if high grass and weeds are growing around it.

Column 5 - Abandoned Appliances. Check if an appliance such as a refrigerator, stove, or washing machine is stored in the yard or in a dilapidated outbuilding. As with automobiles, only one check mark is made despite the number of items. The survey shows the number of premises with these deficiencies, not the number of cars or appliances. Large numbers of abandoned automobiles or appliances should be noted in the space provided for "Remarks."

Column 6 - Other Large Rubbish. Check if there are discarded items too large or otherwise not suitable for storage in the refuse can. Include tires, large cans and drums, tree limbs, rubble and other items not listed in other columns.

Column 7 - Outbuildings. Check only if buildings are dilapidated or in other ways provide significant rat harborage. A tight building or a clean shed in good repair would not be reported.

Column 8 - Privies. Check whenever they are found.

Column 9 - Board Fences and Walls. Check if they are dilapidated and could furnish harborage for rats.

Column 10- Weeds and Grass. Check if they are in excess of 12 inches high and sufficiently thick to hide refuse and to harbor rats.

Rat Signs - Signs of rats are the most important items to be checked, because they indicate an active rat infestation. When the following rat signs are observed, one or more of three columns under "Rat Signs" is checked:

1. Rat burrows - active burrows
2. Rat tracks - fresh foot and tail marks
3. Feces - fresh feces are dark and soft; old feces gray and brittle
4. Gnawing - if fresh
5. Live or dead rats - positive evidence if alive or if carcasses are fresh
6. Rat runs - those currently well travelled
7. Rub marks - if fresh are black, soft, and greasy

Column 1 - Exterior. Check if fresh rat signs are visible in an exterior inspection, even a freshly gnawed entry to a home.

Column 2 - Interior. Check if fresh rat signs are discovered during an interior inspection.

Column 3 - Sewers. Check for the premises nearest to the rat-infestation associated with a sewer manhole, catch basin, or broken pipe in yard. Rat signs must be observed. If there are other sewer deficiencies, do not check them but use an asterisk and a footnote under "Remarks."

Rat Entries - Check rat entries if there is an actual or potential rat entry within 4 feet of the ground or other horizontal surface. If the rat entry is definitely active, put a check in the "Exterior Rat Signs" column also.

Interior Inspection Made - Check this column only if the interior of the house is inspected. Use the "Remarks" column if an explanation is necessary.

Remarks - This space and the back of the form may be used for explaining items checked above or for furnishing additional data concerning important deficiencies.

MAPPING

A wall map of the city is appropriately marked to record program progress. The map is kept up to date as the block forms are turned in. Some programs prepare a map showing the status of the rat infestation and the number of blocks inspected daily. The following criteria may be used for preparing maps:

Maps of Major Deficiencies

Map of Rat Infestation	Color
a. None in block	Blue
b. 0 to 10% of premises infested	Green
c. 11 to 25% of premises infested	Yellow
d. 26 to 100% of premises infested	Red

Map of Refuse Storage		
Low	0 to 10% of premises deficient	Blue
Medium	11 to 49% of premises deficient	Yellow
High	50 to 100% of premises deficient	Red

Map of Large Rubbish and/or Unstacked Lumber	
a. 0 to 10% of premises deficient in block	Blue
b. 11 to 49% of premises deficient in block	Yellow
c. 50 to 100% of premises deficient in block	Red

Map of Abandoned Automobiles or Appliances	
a. None in block	Blue
b. Less than 10% of premises with abandoned automobiles or appliances	Yellow
c. 10 to 100% of premises with abandoned automobiles or appliances	Red

Map of Dilapidated Outbuildings	
a. None in block	Blue
b. 1 to 24% of premises with dilapidated outbuildings	Yellow
c. 25 to 100% of premises with dilapidated buildings	Red

Other maps may be prepared, using similar criteria. If it is desirable to know the actual number of items, such as abandoned automobiles and appliances, this information must be obtained during the original inspection by entering a number, instead of a check mark on the block record.

Map making is not difficult, although considerable skill and care are required to make high quality maps for use for educational purposes. The maps are posted one block at a time from the Summary - Rat Survey.

The map color is determined by computing the premises index for each deficiency. The premises index for a block is computed as follows for the infestation map:

$$\frac{\text{No. of rat-infested premises in block X 100}}{\text{Total premises in block}} = \text{Premises index}$$

The premises index for a larger area, such as a census tract or a zone is computed in the same way, as follows:

$$\frac{\text{No. of rat-infested premises in area X 100}}{\text{Total number of premises inspected}} = \text{Premises index}$$

After the individual blocks have been colored for the infestation map, a public information map with only 3 colors may be prepared to simplify presentation. This map has large blue, yellow, and red areas. It is adapted from the four-color map which has the individual blocks colored by using the following criteria:

Infestation Map for Public Presentations	Color
a. All blocks blue, or more blue than green - area may have a few scattered yellow or red blocks	Blue
b. Blocks predominantly green and yellow	Yellow
c. Blocks predominantly red and yellow, but more red than yellow	Red

Entire census tracts, zones, elementary school district, or wards may be used as units in preparing this map. Each relatively large area has a single color. In addition to being more attractive than a map with individual blocks colored, this map simplifies the discussion of problem areas rather than problem blocks. Smaller maps may be used for meetings of neighborhood associations.

RAT SURVEY QUIZ

The following statements are either true, partially true, or false. Place a + sign before all true statements and a − sign before all false or partially true statements.

( ) 1. A survey should be made at the beginning of a rat control program to furnish data for planning the necessary control operations and public information program.

( ) 2. A resurvey made at the end of the first year's operations helps to determine the effectiveness of control activities, and to evaluate the progress made.

( ) 3. A comprehensive survey is usually preferable to a sample survey because of the high cost of a sample survey.

( ) 4. During inspection of a premises it is <u>not</u> advisable to tell people about the program, for they should receive this information from the newspaper, radio, and television.

( ) 5. The supervisor is responsible for all work activities of his men and should remain in the area where they work to support their activities.

( ) 6. The sample survey is of little value in evaluating progress of a rodent control program.

( ) 7. Most people are pleasant to deal with and will furnish information for filling out the form, making actual inspection unnecessary on some premises.

( ) 8. Permission for inspection may be obtained from any man, woman, or child on the premises.

( ) 9. Rat signs are not important in surveys. They are discussed in the training guide, "Control of Domestic Rats and Mice."

( ) 10. Rat signs, and other problems, are recorded as they are observed, rather than waiting until the inspection is completed.

( ) 11. Inspection of sheds and other outbuildings are essential parts of the survey, as the buildings may provide rat harborage.

( ) 12. It is not necessary for the supervisor to check the completed inspection forms, as only competent inspectors should be hired for the program.

( ) 13. If an active rat entry is discovered both the "Rat Entry" and "Interior Rat Sign" columns are checked.

( ) 14. A business and residential property is checked under both "Residential" and "Business and Residential" columns.

( ) 15. In the end, rat control is really the responsibility of the individual citizen.

( ) 16. The census tract is an excellent urban unit for planning rat control activities.

( ) 17. The "Block Record - Rat Inspection" shows the actual number of abandoned automobiles on every block inspected.

( ) 18. The "Summary - Rat Survey" form has spaces for recording data from 16 "Block Record - Rat Inspection" forms. This limits the number of blocks that can be inspected in a census tract.

( ) 19. The comprehensive block survey requires adequate personnel to inspect every block in the area selected for the program.

( ) 20. If only the addresses, number of dwelling units, and type of premises are entered on the "Block Record - Rat Inspection" form, the block is assumed to have excellent general sanitation.

( ) 21. In figure 2, 1201 and 1207 North Ave. and 1296 South Ave. are the major problem premises.

( ) 22. In figure 2, 1207 North Ave. was given an interior inspection and human or animal food was found unprotected from rats and a rat-bite case had occurred.

( ) 23. In figure 2, the food at 1296 South Ave. was not found in the main building, but in a shed.

( ) 24. Household refuse is a combination of garbage and rubbish that should be stored in a ratproof container until collected for sanitary disposal.

( ) 25. The Block Record - Rat Inspection provides valuable information to the health department in other fields as well as in rat control.